

**IN THE UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF OHIO  
WESTERN DIVISION**

<b>UNITED STATES OF AMERICA,</b>	:	<b>CASE NO. 1:18-CR-0043</b>
	:	
<b>Plaintiff,</b>	:	<b>JUDGE TIMOTHY S. BLACK</b>
	:	
<b>v.</b>	:	
	:	
<b>YANJUN XU,</b>	:	<b>DEFENDANT’S OBJECTIONS</b>
	:	<b>TO THE GOVERNMENT’S</b>
<b>Defendant.</b>	:	<b><u>PROPOSED AMOUNT OF LOSS</u></b>

**INTRODUCTION**

Determining loss in a case where there was no actual loss can be complicated. This is particularly true in an attempted theft of trade secrets case. The commentary to U.S.S.G. § 2B1.1 directs that if there is no actual loss, the court should determine the amount of intended loss. It further suggests that in a theft of trade secrets case, a court may use the cost of development *or* the reduction of value of the trade secret, where “appropriate and practicable.” U.S.S.G. § 2B1.1, cmt., 3(C). Seizing on the first part of that phrase, the government has urged the Court to use research and development costs as a measure of intended loss, and has proposed a number of \$98 million.

The problem is that using the cost of research and development here is neither appropriate nor logical. As readily conceded by the government’s own expert, the potential loss GE Aviation might have suffered if the theft of its trade secrets had been completed has nothing to do with the costs of research and development. GE Aviation will continue to design, develop, build, market, and certify jet engines incorporating composite fan blades and encasements. GE Aviation does not lose the value of those expenditures or that investment if its trade secrets are stolen. Accordingly, the \$98 million figure proposed by the government is simply the wrong

measure of loss. What GE Aviation might, theoretically, lose at some future time is its competitive advantage in the market. This was also readily conceded by the government's expert. However, the government has not offered a shred of evidence or support for a potential reduction of GE Aviation's market share sometime in the future (or the reduced value thereof). It cannot do so because it is too speculative.

Trade secrets, almost by definition, have some inherent value. It is therefore tempting to want to assign a figure to that value. But a court cannot pull a number out of thin air. The determination of loss, while it may be a "reasonable estimate," must be based on evidence and reasons. These do not exist here. Where a court cannot reasonably assign a loss figure, the figure must be zero.

Loss is not the only factor that should inform the Court's ultimate decision, and the Court can fashion its sentence in a number of ways that lead to a reasonable term of imprisonment that is sufficient but not greater than necessary under 18 U.S.C. § 3553(a). But it is inappropriate for a court to squeeze a speculative and unsupported loss theory into the Guidelines that is not supported by the facts. Accordingly, the Court here should determine that the government has failed to establish a specific loss amount, and instead find that the loss is zero.

If and only if the Court accepts the government's argument that research and development costs are the proper measure of loss, which it should not, then it should reject the government's proposed \$98 million figure because it is vastly inflated. As established at the evidentiary hearing, even if China had been successful in obtaining GE Aviation's trade secrets, those trade secrets would only have had the potential of shortening China's development timeline in extremely limited areas. China would still have had to incur the vast majority of the costs set forth on the chart entered into evidence by the government at the hearing, regardless of

whether it obtained GE Aviation's trade secrets. Similarly, GE Aviation would not have lost the value of the costs it incurred in developing the composite components underlying the chart – its investment – even if China had obtained its trade secrets. Accordingly, even under the government's matrix for determining loss, the \$98 million figure is vastly inflated, and the actual intended loss would constitute only a fraction of that amount.

### **PROCEDURAL AND FACTUAL BACKGROUND**

The trial in this case concluded on November 5, 2021, with convictions on all counts. The initial draft of the Presentence Investigation Report was issued on January 28, 2022. Doc. 193. On the issue of loss, the Probation Department accepted the government's position, submitted in a letter dated January 25, 2022 containing a two-page diagram/chart produced by GE Aviation, that the intended loss in this case was \$107 million.<sup>1</sup> PSR at ¶ 57. This amount was based on the argument that the proper measure of loss was the estimated total of GE Aviation's expenditures in designing and certifying a jet engine incorporating fan blades and encasements made from composite materials. In a letter dated February 11, 2022 (and attached to the final PSR), the defense objected to the loss calculation and described how the proper figure was, in fact, zero. In the alternative, the defense asserted that even if the cost of research and development was the correct measure, the \$98 million was vastly inflated and any potential loss to GE Aviation was a mere fraction of that amount. The Probation Department included the government's loss calculation in its final report, issued April 13, 2022. Doc. 197, PAGEID #4894 ("PSR").

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<sup>1</sup> The figure proposed by the government is actually \$98 million (\$107 million was the result of a mathematical error) but the difference does not affect the Guideline range.

Given the wide gulf between the parties' views on the fundamental issue of loss, the Court granted the parties' request for an evidentiary hearing. The evidentiary hearing took place on August 23, 2022. Three witnesses testified. The government called Nick Kray, a senior engineer from GE Aviation (who had also testified at the trial), in an attempt to substantiate the claims made in the two-page chart submitted to the Probation Department, and admitted as Exhibit A at the hearing. The defense called David Zheng, the former GE Aviation engineer who was allegedly urged by Mr. Xu to disclose GE Aviation trade secrets related to fan blades and encasements made of composite materials, and Dr. Barry Davidson, an aerospace expert in composite materials.

Following the hearing, the Court ordered briefing on the issue of loss. The arguments made on behalf of Mr. Xu are set forth below.

### **ARGUMENT**

#### **I. The Court Should Find Zero Loss Because The Commentary of the Federal Sentencing Guidelines is Not Binding on This Court.**

The commentary to the Federal Sentencing Guidelines “has no independent legal force – it serves only to *interpret* the Guidelines’ text, not to replace or modify it.” *United States v. Havis*, 927 F.3d 382, 386–87 (6th Cir. 2019) (en banc), citing *Stinson v. United States*, 508 U.S. 36, (1993). That is because “[u]nlike the Guidelines themselves . . . commentary to the Guidelines never passes through the gauntlets of congressional review or notice and comment. *Id.* Allowing an agency to define the law (as opposed to simply interpreting it) is unconstitutional because it violates the separation of powers. The U.S.S.G. § 2B1.1(b)(1) Guideline states that “if the loss exceeded \$6500, increase the offense level as follows.” The term “loss” is generally understood to mean an amount “lost.” See <https://www.merriam-webster.com/dictionary/loss>. To that general and commonly understood definition of “loss,” the

commentary to the Guidelines adds the term “intended loss,” which is found nowhere in the Guideline itself. *See* U.S.S.G. § 2B1.1 cmt. n.3(A)(i)-(ii). In its *en banc* decision in *Havis*, the Sixth Circuit made clear that where the commentary “adds” conduct or crimes to the Guidelines text, such commentary is not binding. *See Havis*, 927 F.3d at 387. The *Havis* Court determined that the commentary’s addition of “attempt” to the definition of drug crimes, when the text of the Guideline did not include “attempt,” was improper. *Id.* Similarly, the commentary here adds “intended loss” to the common definition of loss, which is actual loss. “By interpreting ‘loss’ to mean intended loss, it is possible that the commentary sweeps more broadly than the plain text of the Guideline.” *United States v. Kirschner*, 995 F.3d 327, 333 (3d Cir. 2021) (internal citations and quotation marks omitted).

It is true that the Sixth Circuit recently concluded in a non-precedential decision that “[t]he commentary defining ‘loss’ is consistent with the construction of the Guidelines as an interpretation of, rather than an addition to, § 2B1.1(b).” *United States v. Murphy*, 815 F. App’x 918, 924 (6th Cir. 2020). However, in light of the Supreme Court’s changing views on the powers of regulatory agencies to interpret the law (*see e.g., W. Virginia v. Env’t Prot. Agency*, 142 S. Ct. 2587 (2022) (limiting the EPA from interpreting the Clean Water Act)), and concerns raised by other circuits about the broad sweep of the commentary in § 2B1.1 cases, Mr. Xu here preserves for appeal the argument that because there was no actual loss in this case, the Court should ignore the commentary’s addition of “intended loss” and conclude that the loss figure is zero.

**II. The Loss Amount Should be Zero Because the Cost of Research and Development is an Improper Measure of Loss in this Case, and the Government Has Offered No Evidence to Establish a Loss Based on a Potential Reduction in Competitive Advantage or Market Share.**

Loss under U.S.S.G. § 2B1.1 is a specific offense characteristic, and “[t]he government must prove the specific offense characteristic by a preponderance of the evidence.” *United States v. Valentine*, 59 F.3d 171 (6th Cir. 1995).

At the evidentiary hearing conducted on August 23, 2022, the government offered testimony and introduced into evidence Exhibit A<sup>2</sup>, which seeks to establish that the approximate cost of the research and development of the composite fan blades and encasement used for a GE Aviation jet engine is \$98 million.<sup>3</sup> For the reasons set forth below, the costs that GE Aviation incurred in researching and developing composite fan blades and encasements are an improper measure of loss in this case.

**A. Legal Standard**

“Loss” is defined as the greater of actual or intended loss. U.S.S.G. § 2B1.1 cmt. n.3(A). Because there was no actual loss here, the Court must determine the amount of intended loss, if any. “Intended loss” is defined as the “pecuniary harm that the defendant *purposely sought to inflict*.” U.S.S.G. § 2B1.1 cmt. n.3(A)(ii) (emphasis added).<sup>4</sup> “Intended loss analysis, as the

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<sup>2</sup> Exhibit A was previously submitted to the Probation Department in connection with preparation of the PSR.

<sup>3</sup> The Probation Department adopted the government’s loss proposal in the PSR, and assigned 24 points for loss under §2B1.1(b)(1)(M). *See* PSR at ¶ 58.

<sup>4</sup> In 2015, the Sentencing Commission amended the §2B1.1 Guideline from a definition of intended loss that stated “pecuniary harm that was *intended to result from the offense*” to its current state: “intended loss means the pecuniary harm *that the defendant purposely sought to inflict*.” U.S.S.G. App. C, amend. 792 (eff. Nov. 1, 2015). The Commission noted that this “amendment reflects the Commission’s continued belief that intended loss is an important factor in economic crime offenses, but also recognizes that sentencing enhancements predicated on intended loss, rather than losses that have actually accrued, should focus more specifically on the defendant’s culpability.” *Id.*

name suggests, turns upon how much loss the defendant actually intended to impose on the victim.” *United States v. Yihao Pu*, 814 F.3d 818, 824 (7th Cir. 2016). Because loss is a specific offense characteristic, the Guidelines do not require a finding of loss greater than zero under § 2B1.1. *See id.* at 828 (“the guidelines do not require a loss calculation greater than zero”); *United States v. Free*, 839 F.3d 308, 323 (3d Cir. 2016) (same).

In determining the amount of loss the defendant intended to inflict, the Guidelines instruct that the Court must “make a reasonable estimate of loss.” However, while the loss figure need not be exact, the Court cannot pick a figure out of thin air. Its loss calculation must be based on reason and facts. *See United States v. Barrington*, 648 F.3d 1178, 1197 (11th Cir. 2011) (“[A] sentencing judge may not speculate about the existence of a fact that would result in a higher sentence, and the government must support its loss calculation with reliable and specific evidence.”); *United States v. Howley*, 707 F.3d 575, 582 (6th Cir. 2013) (“Even a reasonable estimate, however, requires some explanation.”); *United States v. Fairley*, 880 F.3d 198, 216 (5th Cir. 2018) (“the calculation of intended loss cannot be purely speculative.”); *United States v. Altomare*, 673 F. App’x 956, 964 (11th Cir. 2016) (“[T]he district court,[] is not permitted to speculate about the existence of a fact that would result in a higher sentence.”).

This is a case involving the attempted theft of trade secrets. Determining loss in a trade secret case, especially when those trade secrets were not actually stolen, is particularly complicated. *See Howley*, 707 F.3d at 582 (“Determining the value of a trade secret, we acknowledge, is no easy task.”). The commentary to the Guidelines suggests that in trade secret cases, where “appropriate and practicable under the circumstances,” the Court may consider factors such as “the cost of developing that information or the reduction in the value of that information that resulted from the offense.” U.S.S.G. § 2B1.1, cmt. n. 3(C).

B. Research and Development Cost is Not the Proper Measure of Loss in This Case

In proposing the alleged \$98 million cost of research and development as the correct measure of loss in this case, the government and the Probation Department have both seized on the commentary to the Guidelines that suggests using the “cost of developing” the trade secrets as a measure of loss. Exhibit A; PSR at ¶ 58. In so doing, the government and the Probation Department ignore the restriction contained in the commentary, which cautions that the cost of development is only correct where “appropriate and practicable.” *See* U.S.S.G. § 2B1.1, cmt. n. 3(C). Using the cost of development of composite fan blades and an encasement system for a GE Aviation jet engine in this case, under the circumstances present here, is not only *not* appropriate, but it is nonsensical. As the government’s own evidence clearly established at the evidentiary hearing, the cost of research and development is not a loss to GE Aviation. PAGEID #5005, Tr. 45:4-22; PAGEID #5031-32, Tr. 71:10-72:4; PAGEID #5073-76, Tr. 113:21-116:24; PAGEID #5085-87, Tr. 125:11-127:1.

YanJun Xu was convicted of trying to obtain trade secrets from GE Aviation related to fan blades and an encasement made from composite materials. As alleged in the PSR, Mr. Xu sought to obtain this technology on behalf of the People’s Republic of China to assist China to develop and manufacture its own jet engines using composite materials. *See* PSR at ¶ 43. In other words, if Mr. Xu had been successful in obtaining trade secrets from Mr. Zheng, the government’s theory is that those trade secrets might have allowed China to shorten its timeline toward producing its own jet engines using composite materials, which, if successful, would eventually have led China’s aviation industry to stop buying jet engines from GE Aviation. That would, theoretically, have reduced GE Aviation’s competitive advantage at some point in the future and led to a loss of market share. *Id.* at ¶ 45. (“[H]ad Xu been successful in his attempt to



steal trade secrets from GE Aviation, the timeline to develop a similar engine would have been shortened and the biggest obstacle for GE Aviation's competitors would have been removed."").

However, the funds expended by GE Aviation to research, develop, and manufacture composite fan blade and encasement technology is simply not a loss that GE Aviation would have suffered if Mr. Xu had been successful, or that Mr. Xu intended GE Aviation to suffer. Nick Kray, the GE Aviation engineer who testified for the government at the evidentiary hearing, made abundantly clear that GE Aviation was going to research, develop, build, market, and sell jet engines containing composite fan blades and encasements whether or not someone stole GE Aviation's trade secrets:

**Q** Now, just to be clear, obviously, if someone steals some of GE's proprietary information in this area, that doesn't prevent GE from continuing to make -- design, make, sell, fan blades and encasements, right?

**A** That's correct.

**Q** GE doesn't lose the ability to develop, make, market, and sell those products?

**A** I think the key thing is that we're always trying to go the next step in efficiency, so having that process that you can leverage up onto next engine design is key. Yes, we would certainly --

**Q** I understand. And GE would continue to do that?

**A** Certainly.

**Q** Continue to work in this area, right?

**A** Certainly.

**Q** Regardless of whether or not someone had obtained trade secrets or not from GE?

**A** I think it wouldn't -- it wouldn't affect my day-to-day effort, no.

PAGEID #5005, Tr. 45:4-22.

As a result, Mr. Kray readily conceded that the research and development costs were not a potential "loss" for GE Aviation:

**Q** So just going back to where I started, and I'll end there, you agree that -- you know, you've said this -- that the theft of a trade secret could have the potential to affect GE's competitive advantage down the road, right?

**A** That's correct.

**Q** That's the potential loss that GE could suffer, right?

A That's correct.

Q *It's not the money that GE spent to research, develop, build, test, certify an engine with composite fan blades or encasements, correct?*

A *That is correct.*

PAGEID #5031-32, Tr. 71:19-72:4 (emphasis added).

In spite of the logical and reasonable testimony of its own expert, the government (and the Probation Department) are trying to fit a square peg into a round hole. The Seventh Circuit, addressing the same issue in a trade theft case, summarized the situation perfectly:

It seems that the probation officer and the district court simply looked at the evidence and determined that an intended loss amount was required because there was no actual loss. Then, because the guidelines state that the court may estimate loss in a trade secrets case by considering the value of the trade secrets, they simply stated the trade secrets' purported value was the intended loss amount without any analysis about whether that metric worked with the circumstances of Pu's case. The guidelines state that in a trade secrets case, the cost of developing the information should be a factor taken into account to estimate the loss amount when the factor is "appropriate and practicable under the circumstances." Without evidence of Pu's intent to cause the victims to suffer a loss equal to the cost of development, the district court's use of the cost of development to determine the intended loss amount was not appropriate.

*Yihao Pu*, 814 F.3d at 826. That is precisely what is happening here. The government and the Probation Department have fixated on the commentary suggestion that courts may consider "the cost of developing that information" as a measure of loss, ignoring the admonition that it must be "appropriate and practicable under the circumstances," and further ignoring the second part of the commentary suggestion – "*or* the reduction in the value of that information that resulted from the offense." U.S.S.G. § 2B1.1, cmt. n. 3(C)) (emphasis added).

The government's entire theory of loss is, in fact, based on a theoretical future reduction in GE Aviation's "competitive advantage." *See* Govt. Letter to Probation, 01/25/22, at 3, 5; PSR at ¶ 45. That was consistently confirmed by the government's expert, Mr. Kray, who testified both at the trial and at the evidentiary hearing that any potential loss that GE Aviation might

suffer as a result of a theft of its trade secrets was a reduction in its current competitive advantage. *See e.g.*, PAGEID #5004, Tr. 44:2-25. He agreed that whatever possible loss GE Aviation might endure was years down the road, if and when China (or some other competitor) built its own engines with composite technology, at which point GE Aviation would no longer hold a monopoly in this area. *See* PAGEID #5006, Tr. 46:1-5 (“if you lost technology today, to actually see it show up in the field might be five or ten years, right. So yeah, it wouldn’t happen tomorrow, but it would happen down the road, yes.”). In other words, the true measure of loss, if any, is not “the cost of developing that information” rather, it is the potential “reduction in the value of that information.” U.S.S.G. § 2B1.1, cmt. n. 3(C)(ii).

C. The Government Has Not and Cannot Present Evidence to Support a Finding of Loss Based on a Future “Reduction in the Value” of the Trade Secrets

The government has offered no evidence to allow for even a “reasonable estimate” of GE Aviation’s potential future reduction in competitive advantage and market share (and value thereof). Instead, it has substituted a research and development figure that is simply unrelated to the potential loss GE Aviation might have suffered, and is therefore not “appropriate” (U.S.S.G. § 2B1.1, cmt. n. 3(C)) in determining loss in this case. Because the government has failed to meet its burden of establishing a specific offense characteristic of loss, the loss is zero.

And, the greater problem for the government is that assessing any future potential loss in “competitive advantage” is utterly speculative. As Mr. Kray conceded, whatever that possible future loss in competitive advantage might be depends on a number of unknown variables, such as:

- how fast a competitor can research, develop, build, and get certified the same technology;
- how far along in the process the competitor already is when it acquires the trade secret;
- the nature of the trade secret and its relative importance to the development process; and
- whether in the meantime, other competitors have caught up, and therefore GE Aviation’s market share is already diluted.

PAGEID #5006-08, Tr. 46:23-48:6. Ultimately, Mr. Kray agreed that assigning a “loss” number to whatever reduction in market share GE Aviation might suffer years into the future was extremely difficult if not impossible in light of the unknown variables:

**Q** Okay. So you would agree, right, that sitting here today calculating what such a future potential loss to a competitive advantage or market share -- calculating a number would be really difficult, right?

**A** I would say the number would only go up. Right.

**Q** Well, but you can’t, you can’t put a number on that right now because of all of these variables that we talked about; isn’t that right?

**A** Okay. Another way to look at it, sure.

PAGEID #5007-08, Tr. 47:23-48:6.

The conclusion that intended loss cannot be determined in certain trade theft cases is consistent with analyses conducted by other courts that have grappled with this issue. For example, in *Pu*, the defendant pled guilty to stealing trade secrets – source codes for software programs – from two employers. *Pu*, 814 F.3d at 818-21. Although there was no actual loss, the court used the development costs of the source codes to calculate an intended loss of \$12 million. *Id.* at 822. The defendant appealed and the Seventh Circuit reversed, finding that the court erred by “simply look[ing] at the evidence and determin[ing] that an intended loss amount was required because there was no actual loss.” *Id.* at 826. The Seventh Circuit instructed as follows:

We do not doubt that the cost of development of the trade secrets was an easy figure to use when making the intended loss calculation. The guidelines suggest that the cost of development is the metric to use to estimate loss in a trade secrets case. But the real question is whether the government proved by a preponderance of the evidence that the cost of development of the trade secrets was the correct loss figure. To answer this, we must determine whether the record supports a finding that it was more likely than not that *Pu* intended to cause a loss to the victims that equaled the cost of development. We conclude that it does not.

*Id.* (internal citations omitted).

The Tenth Circuit reached the same conclusion in *United States v. Snowden*, 806 F.3d 1030, 1033 (10th Cir. 2016). There, the defendant pled guilty to unlawfully obtaining information after he hacked a computer and intercepted emails and client lists from his former employer and used them to start his own company. The district court calculated intended loss based on the victim's development cost. On appeal, the Tenth Circuit held that "we do not read that language in the commentary as contradicting the guideline by substituting *cost of development* for *loss* in calculating the offense level." *Id.* at 1033 (emphasis in original). Yet "the evidence before the district court was that [the victim] did not suffer any business loss from Defendant's acts." *Id.* "'Loss' is the key," the court held, "and the development cost was not adequately tied to any loss actually suffered by [the victim]." *Id.*; see also *United States v. Isler*, 983 F.3d 335, 341–42 (8th Cir. 2020) (district court found that loss was impossible to calculate even though the government provided several different alternatives for calculating loss and instead agreed with the Probation Department that loss was minimal (\$5000)).

A particularly instructive case is *United States v. Yu Xue*, No. CR 16-22, 2020 WL 5645765 (E.D. Pa. Sept. 22, 2020). In *Yu Xue*, the defendants pled guilty to theft of trade secrets from a large biopharmaceutical company that manufactured cancer-fighting products. At sentencing, the government argued that the intended loss was greater than \$550 million. The defendants argued it was \$0. The parties submitted loss calculation memoranda, conducted a three-day hearing, and filed post-hearing briefs. The government put on five experts, who asserted that the value of the stolen information was between \$200 million and \$2.2 billion.

One of the two defendant experts testified that the government's method for calculating loss was inappropriate since it did not assess harm, which he explained was the only proper method to calculate loss in cases involving theft of trade secrets. As he explained it, the critical

inquiry is whether the victim was deprived of economic opportunity and whether the marketplace was changed as a result of the misappropriation. Yet, in his opinion, there was no loss in the case because there was no evidence that the pre-theft value of the stolen information was affected in any way by defendants' actions. *See id.* at 11.

Convinced, the court held that neither fair market value nor cost of development were appropriate methods to calculate loss since there was no evidence that defendants intended to cause the victims to suffer such a loss:

The Government has failed to meet its burden to prove intended loss in this case because it did not show by a preponderance of the evidence that its suggested loss figure was one Defendants purposefully sought to inflict upon GSK. As a result, while the Government produced evidence of the fair market value and development cost of the stolen information, it failed to establish that Defendants purposefully sought to inflict that amount of harm upon GSK. This critical error was fatal to the Government's position.

*Id.* at 17. Accordingly, as the government had failed its burden to establish an intended loss figure based on reason and evidence, the court concluded that the loss was zero.

The same result should occur here. In *United States v. Howley*, 707 F.3d 575, 582 (6th Cir. 2013), the Sixth Circuit has already reversed a finding of zero loss by the district court.<sup>5</sup> It did so, however, not because a zero loss determination is never appropriate in a trade theft case, but because the district court failed to explain its reasons for concluding that it could not make a loss finding. While the Court expressed some concern about zero loss in a case where a trade secret has, by statute, an "independent economic value", "[t]he ultimate decision is up to the district court, which is in a unique position to assess the losses Roberts and Howley intended to cause. All we require is that the court provide reasons for its choice." *Id.* at 582-83.

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<sup>5</sup> Notably, *Howley* was decided before the change to the Guidelines came into effect in 2015 making the subjective intent of the defendant the operative inquiry.

The reasons here are obvious. GE Aviation's costs of research and development as a proxy for intended loss are simply inappropriate and illogical under the circumstances. Mr. Xu did not intend for GE Aviation to suffer losses equal to its research and development costs. He allegedly intended for China to speed up its own development of jet engines with composite fan blade and encasement technology in order to become competitive in the market.<sup>6</sup> The government has presented zero evidence to allow the Court to reasonably estimate what a potential market share loss (and a consequent gain for China) could be, because determining such a number about events that *might* occur years, if not decades, in the future is impossible and utterly speculative.<sup>7</sup> Without evidence, the Court cannot just pick a number and assign it as loss, and is therefore left with no choice but to determine that the loss for Guidelines' purposes in this case is zero.

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<sup>6</sup> And even that assertion is speculative. It is equally plausible that the information sought would only prove valuable to corroborate work already done by Chinese manufacturers, or that it could offer interesting topics for discussion among Chinese aviation experts, but would not necessarily advance China's manufacturing timeline. PAGEID #5084-85, Tr. 124:1-125:10.

<sup>7</sup> The government's brief and half-hearted effort to suggest that future fuel cost savings might be another measure of loss must fail for the same reasons as any assessment of future market share loss. It is impossible to reasonably estimate those fuel cost savings in light of the numerous unknown variables at issue here. For example, that figure depends on the number of planes purchased, the business plans of the customers who might prefer a cheaper engine to one that has composite materials, the time period when China or other competitors catch up with GE and put their own engines on planes, and a whole host of other unknowables. PAGEID #5027-29, Tr. 67:5-69:12. As the government's expert conceded at the hearing:

**Q** But when you're trying to calculate a number of what -- what loss GE might suffer by not being able to sell its engines down the road, right, that number is far ahead in the future because sitting here today, as you said earlier, you can't really calculate that number, right?

**A** A way to look at it, sure.

PAGEID #5029, Tr. 69:7-12. This alternative measure of loss is therefore far too speculative to provide a reasonable estimate.

**III. In the Alternative, If the Court Somehow Determines that Cost of Research and Development Is a Proper Measure of Loss, the Court Should Reject the Government's \$98 Million Estimate of Loss.**

Even if the cost of research and development of composite fan blades and an encasement for a jet engine were the proper measure of loss, which it is not, the government's proposed loss figure of \$98 million is vastly inflated and cannot serve as a reasonable estimate of loss. As noted above, GE Aviation's expert made clear that GE Aviation would expend the costs associated with research and development whether or not China (or some other competitor) obtained trade secrets. PAGEID #5031-32, Tr. 71:10-72:4; PAGEID #5073-76, Tr. 113:21-116:24; PAGEID #5085-87, Tr. 125:11-127:1. Thus, the only logical analysis using GE Aviation's research and development costs would be to determine whether a theft of trade secrets related to this process could have led to cost or time savings for China. According to the evidence established at the evidentiary hearing, however, the only potential time and cost savings for China in its development process by possessing GE Aviation's secrets would be limited to a very narrow band on the research and development chart. PAGEID #5076, Tr. 116:11-24; Exhibit A.

At the outset, it is important to point out that the processes described in the government's Exhibit A and \$98 million financial expenditures encompass vast amounts of information that are not trade secrets. And, the government has failed to identify where in the building block process or categories contained in Exhibit A trade secrets can be found.<sup>8</sup> To that point, Mr. Zheng did not have access to proprietary information related to the entire design process, and Mr. Xu therefore could not have obtained trade secrets related to the entire research and design

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<sup>8</sup> Indeed, Exhibit A contains no data to substantiate the government's cost arguments but is simply a graphic without any detailed representation of the kinds of tests and processes that GE Aviation actually employs.



module contained in Exhibit A. PAGEID #5037, Tr. 77:15-22. As Mr. Zheng testified, he worked exclusively on encasement system design and manufacturing, and had only limited access to fan blade design and manufacturing information. PAGEID #5037, Tr. 77:11-19. Moreover, Mr. Zheng's general access to information was restricted on a "need to know" basis and was further limited by his role as a "staff" engineer. PAGEID #5037-38, Tr. 77:15-78:9. Finally, Mr. Zheng made clear to the Chinese the limits of his knowledge and access to information. PAGEID #5039, Tr. 79:1-24; PAGEID #5045-46, Tr. 85:1-86:2. Accordingly, Mr. Xu could not have allegedly intended any loss to GE Aviation beyond what he believed Mr. Zheng could provide.

It is also relevant in this regard that Mr. Zheng worked exclusively on encasement systems for the GE9X engine, designed to be fitted on a Boeing 777, a large, wide-bodied plane. PAGEID #5043, Tr. 83:8-12. Mr. Kray conceded that China has so far only manufactured the C919 jetliner, which is a smaller plane akin to the Boeing 737, and has not yet built a larger passenger plane. PAGEID #5025, Tr. 65:4-15. The C919 uses the LEAP engine, a joint project of Safran and GE Aviation. PAGEID #5025, Tr. 65:16-19. In the short term, at least, it is far more likely that China would have been interested in replacing the LEAP engine with a home-built version for its existing fleet. However, Mr. Zheng did not work on the LEAP engine, and his information on composite encasements would therefore have had limited value, given the highly particularized nature of these systems. PAGEID #5025-26, Tr. 65:23-66:1.

Returning to the chart in Exhibit A, \$80 million of the government's proposed \$98 million loss figure is swallowed up by containment certification testing and containment rig testing. Both the government's expert, Mr. Kray, and the defense expert, Dr. Davidson, agreed that the certification test *must* be performed by anyone who is seeking to put a jet engine on an

airplane and have it certified to carry passengers, and that it would be cavalier and compromise safety to skip the containment rig test.<sup>9</sup>

**Q** And any competitor of GE Aviation's who builds a jet engine would have to go through this certification process, correct?

**A** Yes.

**Q** And that's whether or not they built that engine using, let's say, GE's proprietary information, right?

**A** I would say any engine that gets built has to be certified to those rules.

**Q** Right. And my question is, even if that engine uses some trade secrets of GE's to be built --

**A** It would still have to be certified, sure.

**Q** -- it would still have to be certified, right?

**A** Yeah.

PAGEID #5013, Tr. 53:4-16 (Kray); PAGEID #5075, Tr. 115:17-23 (Davidson) ("And so they have got to do their own containment rig testing. They're not cavalier. They're not going to go from subcomponent testing to designing a big, full-scale rig test and end testing it. So they've got to do containment rig testing, so it doesn't save them anything. So I would say Rows 1, 3, 5, 6 make no difference whatsoever.").

Since any jet engine manufacturer, including China, has to go through the containment rig and containment certification test process, and these tests (because everyone has to conduct them) do not employ trade secrets, Mr. Xu could not have "intended" to cause a loss regarding that

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<sup>9</sup> Although the containment rig test is not required for certification, Mr. Kray testified that it would be "cavalier" to skip that test, it could compromise safety, and might affect the success of the extraordinarily expensive certification test. PAGEID #5016, Tr. 56:4-14. More importantly, Dr. Davidson testified that the bilateral agreement between China and the FAA essentially requires China to follow the building block approach in jet engine manufacturing, which includes containment rig testing. PAGEID #5056-57, Tr. 98:17-97:15. Moreover, nothing in the literature suggests that China takes a "cavalier" approach to passenger safety. PAGEID #5075, Tr. 115:13-23.

testing. The cost of this testing has to be borne regardless. Accordingly, \$80 million of the \$98 million should not be considered by the Court in determining loss.<sup>10</sup>

Second, both experts agreed that the type of fiber and resin used in manufacturing the composite material used to build fan blades and encasements has a profound impact on the entire design cycle and would impact test results all along the way.

**Q** ...the fiber that is selected, that can control the entire design cycle in the sense that if you pick one fiber versus another fiber, they can have different results?

**A** That's true.

PAGEID #5017, Tr. 57:5-25 (Kray); PAGEID #5070, Tr. 110:10-19 (Davidson). The experts also agreed that because carbon fibers are export controlled, China cannot purchase its fibers from the same source as GE Aviation. PAGEID #5018, Tr. 58:15-25 (Kray); PAGEID #5071, Tr. 111:19-25 (Davidson). Since China cannot use the same fibers as GE Aviation, the evidence established that its test results will not be identical to GE Aviation's results. Indeed, Mr. Kray testified that unless a competitor's design and manufacturing of these materials were essentially identical to GE Aviation's, that competitor would have to go through the same process and incur the same costs:

**Q** And if a competitor were not to have all of those essentially same or identical processes, materials, that sort of thing, tools, they would have to go through this process on their own, wouldn't they?

**A** That's correct.

PAGEID #5021, Tr. 61:20-24.

There is really no dispute that China, like every other manufacturer of jet engines, uses the building block method in its design and manufacturing process. PAGEID #5008-08, Tr.

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<sup>10</sup> Moreover, a significant portion of the \$10.5 million estimated labor costs should not be considered, as they are included in the containment rig and certification tests. *Id*; *see also*, Exhibit A.

48:25-49:13 (Kray). That method relies on trial and error, continual testing, software projections, retesting – to eventually move from a small coupon of composite material to the entire blade and encasement. All through the process, the materials used (fibers and resins), the tools, the assembly – affect test results. If there was one significant take-away from the testimony of both Mr. Kray and Dr. Davidson, it was that unless these processes are identical, most, if not all, of the steps required to build composite fan blades and encasements would have to be taken by the manufacturer, regardless of whether that manufacturer had access to another manufacturer's trade secrets or test results. *See e.g.* PAGEID #5008-08, Tr. 48:25-49:13 (Kray); PAGEID #5081-82, Tr. 121:14-122:8 (Davidson) (“Manufacturing a woven case is incredibly complex, and GE spent hundreds of millions of dollars working this out, and their process really cannot be replicated. So, so if the Chinese were to make a woven case, they would be using a different material, they would be using different manufacturing equipment. They would definitely get a different weave. They would definitely get a different fiber volume fraction, different resin distribution, different resin flow, which I can go through in great detail. It would not shorten any aspect of their Building Block approach.”)

The government's expert, Mr. Kray testified that being in possession of GE Aviation's proprietary information might give a competitor a “leg up.” PAGEID #5029-30, Tr. 69:25-70:20. But he conceded that the nature of that advantage was difficult to assess, and that the competitor would still be required to go through “their own magnitude of testing”:

**A** I think it would give them a leg up. It would give them a jump start, if you will, in the process; but, certainly, they would have to go through their own magnitude of testing, certainly.

**Q** Right. You said it might give them a leg up, so to speak?

**A** Um-hmm.

**Q** But you don't know how high that leg is, right, you have no way of knowing?

**A** That's true.

**Q** And if anyone takes shortcuts in the building of an aircraft engine, they risk not getting -- getting through certification, right?

**A** That's true.

**Q** They risk their product failing, right?

**A** True.

*Id.* Moreover, neither Mr. Kray nor anyone else ever defined what that “leg up” might consist of. *See id.* No one testified, for example, that if China had obtained information about particular test results, it could have skipped its own testing in any significant way, or could have gone to manufacturing quicker, or that such information would have led to any other material improvement. The “leg up” comment was entirely conclusory without any data, evidence, or facts to back it up. In contrast, Dr. Davidson disagreed that obtaining trade secrets would give China a “leg-up”: “So I guess would there be -- if the Chinese had some information on GE’s internal processes, would it provide them, you know, a leg up, so to speak? And, again, beyond a few tests here and there, I don’t see it . . . .” PAGEID #5082, Tr. 122:13-16.

Fourth, in assessing the value of any potential trade secrets, it matters greatly how far along Chinese aviation was in 2017 in designing and manufacturing its own fan blades and encasement systems made from composite materials. Whatever “short cut” or “leg up” the possession of GE Aviation’s trade secrets might theoretically have given China would be meaningless if China had already progressed in the design process past the point where such information might be useful. As he testified at the hearing, Dr. Davidson carefully reviewed the available literature on China’s progress in this area, which consisted of peer-reviewed articles in reputable publications, not self-promoting media accounts. PAGEID #5093-94, Tr. 133:24-134:24. Dr. Davidson’s review of the literature revealed that:

they knew how to do material properties, select. They knew how to do the first, the down-select, how to look at different materials. They certainly knew how to do material property characterization, allowable testing. They’ve done many subcomponent tests. Really, you can see a progression like -- let me just talk

about containment rig. So in 2017, they published a subscale containment rig test. So it's really the same thing GE does, but on a scaled-down containment rig.

PAGEID #5077, Tr. 117:5-21. In other words, referring to Exhibit A, a review of the literature revealed that by 2017, the Chinese had moved through the first five blocks of the design process, to the containment rig test. It was therefore Dr. Davidson's opinion that employing information obtained from GE Aviation that related to the first five blocks would not have been helpful to the Chinese because it was unlikely they would have wanted to backtrack, undo all of their own substantial progress and start again from the beginning (knowing that without access to the same materials, equipment and processes of GE Aviation that approach would necessarily fail):

So to do -- they wouldn't go back in time, they wouldn't say, oh, well, let's redo GE's subcomponent test, because now they would be on a parallel track. And it's a foregone conclusion, they've already figured out that's not going to work, this approach is going to work better, and they demonstrated it worked. So no, it would have slowed them down, it would have cost them money.

PAGEID #5079, Tr. 119:18-24.

Whatever information Mr. Xu allegedly could have obtained, therefore, had he been successful, would have brought China little to no benefit in its development of the fan blade section of the engine and would not have reduced China's timeline in becoming competitive. That, ultimately, was the conclusion drawn by Dr. Davidson. *Id.* He opined that in the research and design process, the only area in which GE Aviation's trade secrets might have had some benefit to the Chinese would have been in the "sub-component" testing matrix, which, according to GE Aviation cost \$500,000. *See* Exhibit A. As he testified,

So I would say that if there's any savings to the Chinese, it's in subcomponent testing, and of this point 5 million,<sup>11</sup> it's a portion of it. I don't know. So maybe they save 10 percent, maybe they save 1 out of 10 tests, maybe they save something like that, so maybe they save 500K. And then there's a sliver of design

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<sup>11</sup> Dr. Davidson misstated this amount. GE Aviation has identified this cost as \$500,000, not \$5 million. *See* Exhibit A.

labor that they would save because they saved that 1K. So that's the kind of savings I think the Chinese would achieve.

PAGEID #5076, Tr. 116:13-20. Moreover, Dr. Davidson observed that whatever savings China might have had in this area, if any, would have had minimal to no impact on its *timeline* for developing composite engine parts. *Id.*; PAGEID #5079, Tr. 119:18-24.

Based on the uncontroverted evidence elicited at the evidentiary hearing, even if China had obtained the trade secrets it allegedly sought, its savings would have been minimal and its timeline would have been unaffected. Thus, even if the Court were to employ the costs of research and development as a proper measure of loss, and the Court used China's potential cost savings as a proxy for GE Aviation's non-existent loss, those cost-savings would be a mere fraction of the \$98 million figure proposed by the government. The technology at issue here is so highly engineered and complex, virtually all of the costs of research and development would have been incurred both by GE Aviation *and* by China, whether or not trade secrets had been obtained. PAGEID #5031-32, Tr. 71:10-72:4; PAGEID #5073-76, Tr. 113:21-116:24; PAGEID #5085-87, Tr. 125:11-127:1. There was not, and importantly, could not, have been a "smoking gun" or "crown jewels" or secret formula obtainable by China that would have in any significant way reduced its own process and timeline in building this technology. *See* PAGEID #5103, Tr. 143:5-12 (Davidson) ("Q ...do you believe there's any game-changing crowned jewel information at GE Aviation that could have had a substantial impact on China's own development of its containment casing and fan blades? A Given the constraints of China, you know, having the limitations it does due to export controls, I don't see it, no. I would say no, there is not.").

Accordingly, even if the Court were to use the cost of research and development as a measure of loss, based on the uncontroverted evidence produced at the hearing, cost savings, if

any, could only have occurred in the “sub-component testing” phase. That phase, as proffered by GE Aviation, cost \$500,000 and the evidence showed that only a fraction of that amount could potentially have been saved by the Chinese. Thus, if a loss were to be set based on this method, it would not be \$98 million. It would be closer to \$50,000.

### **CONCLUSION**

It is perhaps discomfoting to conclude that a case involving theft of trade secrets might have no loss or intended loss. Trade secrets, almost by definition, carry some value. But as made clear above, setting a loss amount for purposes of the Guidelines cannot be done in a speculative manner disconnected from the facts and evidence. Even a “reasonable estimate” must be based on facts and on reasoned legal analysis. The Court here simply has not been provided sufficient information by the government to reach a reasonable conclusion. First, the money GE Aviation spent to build the fan module of a jet engine is not a loss. GE Aviation hasn’t lost those funds and, as its expert testified, will continue to develop, design and build fan blade technology made from composite materials. Since GE Aviation does not lose the ability to make this technology and does not lose the investment it made by designing and building it, Mr. Xu could not have “intended” to cause GE Aviation to lose that investment.

Second, the government has offered no evidence that GE Aviation’s competitive advantage at some distant point in the future could have been compromised if China had obtained these trade secrets. It certainly has not offered any evidence that would allow the Court to reasonably estimate what such a future loss of competitive edge, or market share, might be.<sup>12</sup> Indeed, there is no way to estimate such a future potential event. GE Aviation’s position in the

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<sup>12</sup> In fact, the government’s expert, Mr. Kray, was reluctant even to admit that a potential change in GE Aviation’s competitive advantage might lead to a reduction in market share. PAGEID #5005-06, Tr. 45:1-46:5.



market in five or ten or fifteen years depends on numerous variables that are currently unknown. It would, therefore, be utter speculation to try to capture such future events at this point.

Third, even if the Court did seek to employ the cost of research and development as a reasonable measure of loss – which it is not – that reasonable estimate would have to be a mere fraction of the \$98 million proposed by the government. As discussed above, virtually all of the steps GE Aviation undertook to arrive at the final product would have to be undertaken by Chinese jet engine manufacturers as well, even if they were in possession of GE Aviation’s trade secrets. The nature of this technology, the extraordinary complexity of the engineering, and the building block approach all manufacturers use do not lend themselves to skipping steps. GE Aviation’s process cannot be replicated, and to the extent there is any savings in cost at all, it would be minimal.

For all of these reasons, the Court should determine that the government has not met its burden of establishing the special characteristic of loss under U.S.S.G. § 2B1.1(b)(1).

Respectfully submitted,

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**CERTIFICATE OF SERVICE**

I hereby certify that on September 20, 2022, a copy of the foregoing was filed electronically. Notice of this filing will be sent to all parties in this case by operation of the Court's CM/ECF system. Parties may access this filing through the Court's system.

/s/ Sanna-Rae Taylor